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## The Beetle-Mite Fauna of Mary's Peak, Coast Range, Oregon (Acarina).

By H. E. EWING, Iowa State College, Ames, Iowa.

(Plate III.)

Studies of a mountain flora or fauna have usually had a special fascination to most naturalists. Especially is this the case where the mountain flora or fauna studied is at such an altitude as to belong to a different life zone from that of the surrounding country. While located in Oregon the writer had such an opportunity of studying a mountain fauna and its relation to that of the surrounding region belonging to a different life zone. For several summers I made collections from the top of Mary's Peak, and also from surrounding regions. Mary's Peak is one of the Coast Range Mountains of western Oregon. It is in Benton County, and is situated about 15 miles southwest of the town of Corvallis, the county seat.

This mountain is the highest of the whole region in which it is situated. It rises to a height of about 4,000 ft. above the sea level, and can be seen from many points of the Willamette Valley, with its long "hog-backed" north spur and its precipitous south slope. Beginning at its base Mary's Peak is densely wooded, and continues so almost to its very top. The entire top, including a considerable region to the southwest, is quite bare of trees, but is thickly covered with a heavy growth of grass. The only places that are somewhat open below this grassy region are a few along the streams which rise from the base of the snowline. Snow stays on the top of the mountain for six or eight months of the year and, around the base of the grass land, drifts do not melt away until June or July. The forest trees found at the base are chiefly Douglas fir with a few Pacific coast white oaks. Higher up are cedars, and near the top the noble fir. Along the streams are thimble-berries and vine maples. There is a good rainfall over the whole of the mountain, and the vegetation is luxurious.

The types of the new species and varieties described below are in the author's collection.

A LIST OF SPECIES AND VARIETIES RECORDED FROM MARY'S PEAK, TOGETHER WITH DESCRIPTIONS OF NEW ONES.

Family ORIBATIDAE.

**Eupelops monticolus** n. sp. (Pl. III, fig. 1).

Color of species a chestnut brown. Lamellae very large, of about equal width throughout, and almost as long as the cephalothorax. Pseudostigmatic organs extending forward, clavate, and slightly pectinate. Abdomen about as broad as long, evenly rounded behind, and bearing a few minute hairs. Genital opening roughly rectangular and situated about one and one-third times its length in front of the anal opening. Anal opening larger than the genital opening, somewhat circular in outline, and situated about two-thirds its length from the posterior margin of ventral plate. Tarsus of leg I about equal to tibia in length. Integument of lamellae and pteromorphae irregularly tuberculate. Length, 0.48 mm.; width, 0.33 mm.

From top of Mary's Peak, Oregon; in moss; by the writer. Three specimens obtained.

**Eupelops monticolus** Ewing, var. **subborealis** n. var. (Pl. III, fig. 2).

This variety is somewhat smaller than the type. The pseudo-

stigmatic organs are longer and subfusiform in shape instead of being clavate. The lamellae, also, are not so conspicuous. Length, 0.46 mm.; breadth, 0.32 mm.

From Corvallis, Oregon; under a log; by the writer.

*Achipteria oregonensis* n. sp. (Pl. III, fig. 3 and text fig. 4).

A very dark brown, smooth species. Lamellae extending beyond the tip of the cephalothorax, and each ending in a cusp-like point. Lamellar hairs reaching to about the tips of the lamellae, curved, pectinate, and each situated on the inner margin of the free part of the lamella near the base. Interlamellar hairs, long, curved, simple (or minutely pectinate), and not reaching the tips of the lamellae. Pseudostigmatic organs extending forward, subfusiform, and simple. Abdomen almost as broad as long, evenly rounded behind, and hairless above. The long cusps of pteromorphae are curved outward and downward toward their tips, and do not reach the tip of cephalo-

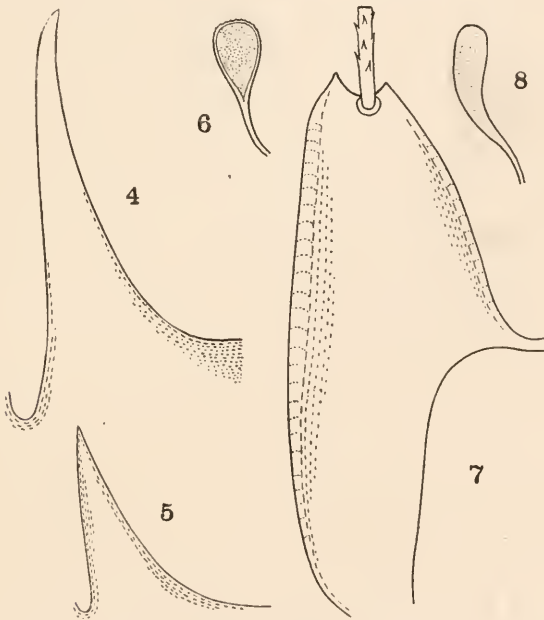


Fig. 4.—*Achipteria oregonensis* n. sp. Cusp of right pteromorpha, dorso-lateral aspect.

Fig. 5.—*Achipteria oregonensis* n. sp., var. *borealis* n. var. Cusp of right pteromorpha, dorso-lateral aspect.

Fig. 6.—*fugatala lamellata* n. sp. Left pseudostigmatic organ seen from above.

Fig. 7.—*fugatala lamellata* n. sp. Left lamella from above.

Fig. 8.—*Oribatella acuta* n. sp. Left pseudostigmatic organ from above.

thorax. Genital opening subrectangular, smaller than anal opening, and situated a little more than its greatest diameter in front of the latter. Legs long; claws heterodactyle. Length, 0.71 mm.; width, 0.53 mm.

From Corvallis, Oregon; on ground under an old piece of wood; by the writer. Several specimens. This species has a variety, found at the top of Mary's Peak.

**Achipteria oregonensis** Ewing, var. **borealis** n. var. (Text fig. 5).

Differs from the type in being smaller, in having shorter cusps to the pteromorphae, and in having the lamellar hairs less curved. Length, 0.51 mm.; width, 0.39 mm.

From the top of Mary's Peak, Oregon; under a rotting log; by the writer. Only a single specimen secured.

**Jugatala lamellata** n. sp. (Text figs. 6 and 7).

A rather large, chestnut brown species. Lamellae very large, attached to cephalothorax for about one-half their length, the free anterior part of lamellae about twice as broad as the attached posterior part, and ending in two cusps, the outer being the longer. Lamellar hair situated between lamellar cusps; curved, pectinate, and almost as long as the lamella. Pseudostigmatic organs capitate and simple. Abdomen almost as broad as long, and sparsely clothed with curved, pectinate setae. Pteromorphae large, rounded on their ventral margins. Genital covers smaller than anal covers and situated about twice their length in front of the latter. Posterior legs not extending beyond the tip of abdomen. All the legs provided with long, almost subequal claws. Length, 0.77 mm.; width, 0.53 mm.

From the top of Mary's Peak, Oregon; under a moist stone; by the writer. From Spenson, Oregon; on rotting vegetable material, by H. F. Wilson. Three good specimens obtained. The type from Spenson, Oregon.

**Ceratozetes clavilanceolata** (Ewing).

Recorded from top of Mary's Peak, Oregon; under rotting logs; by the writer.

**Oribatella minuta** Banks.

Recorded from top of Mary's Peak, Oregon; in moss; by the writer. Recorded also from Corvallis, Oregon; under bark of a log; by the writer.

**Oribatella acuta** n. sp. (Pl. III, fig. 9, and text fig. 8).

A smooth, dark chestnut brown species. Lamellae very large, attached to the cephalothorax for over one-half their length, and each

ending in a sharp point. Lamellar hairs short, stout, simple, and curved; slightly surpassing the tips of lamellae. Pseudostigmatic organs short, subcapitate, simple, and extending forward. Abdomen longer than broad, sparsely clothed with rather short, strongly curved, simple setae. Pteromorphae large, attached to abdomen for over one-half its length, and rounded below. Genital opening circular, much smaller than anal opening and situated about one and one-half times its diameter in front of the latter. Legs rather short; last pair not reaching the tip of abdomen; claws heterodactyle. Length, 0.54 mm.; width, 0.39 mm.

From the top of Mary's Peak; under rotting logs and in moss; by the writer. Many specimens. This species belongs to that group of Oribatellas that have the lamellae similar to those of the genus *Achipteria* Berlese.

Family NOTHRIDAE.

*Liacarus bidentatus* n. sp. (Pl. III, fig. 10).

A rather large, chestnut brown, shiny species. Lamellae extending almost to tip of rostrum, their anterior third free, and each ending in a small inner cusp. Lamellar hairs long, straight, apparently simple; each arising from tip of lamella outside of cusp, and extending far beyond the tip of cephalothorax. Pseudostigmatic organs simple, swollen toward base, beyond which they are setiform. Abdomen almost as broad as long, hairless above. Genital opening somewhat shield-shaped, very much smaller than anal opening, and situated about twice its greatest diameter in front of the latter. Legs long; claws heterodactyle. Length, 0.91 mm.; width, 0.62 mm.

From top of Mary's Peak, Oregon; under a rotting log, and under a moist stone; by the writer. From Corvallis, Oregon; under logs; by the writer. From Cascade Mountains along Santiam River; under a log; by the writer. The description here given is based on the type specimen from Mary's Peak, under a moist stone. The specimens from Corvallis are slightly larger than the type.

*Liacarus robustus* n. sp. (Pl. III, fig. 11).

A large, almost black, shiny species. Lamellae about four-fifths as long as cephalothorax, with their anterior third free, and not ending in cusps. Between the free ends of the lamellae is situated a central mucro, which surpasses the tips of the lamellae, but does not reach the tip of the rostrum. Lamellar hairs long, straight, minutely and sparsely pectinate; each arises from the tip of lamella. Pseudo-

stigmatic organs simple, swollen toward their middle, beyond which they are stoutly setiform. Abdomen very large, oval, and without hairs above. Genital opening somewhat shield-shaped, much smaller than anal opening, and situated over twice its greatest diameter in front of the latter. Anterior legs extending beyond the tip of rostrum by about the full length of their tarsi; posterior legs falling considerably short of the tip of abdomen. Length, 1.00 mm.; width, 0.68 mm.

From the top of Mary's Peak, Oregon; under rotting logs; by the writer. From Corvallis, Oregon; under bark of stick lying on ground; by the writer. The specimen from Corvallis is considerably larger than the others. The type from Mary's Peak.

***Liacarus aequidentatus*** n. sp. (Pl. III, figs. 12, 13).

A large, dark brown, shiny species. Lamellae large, practically as long as the cephalothorax, widest toward their middle, and each ending in two small, equal cusps. Lamellar hairs long, straight, simple; each arising from the end of lamella between the two cusps, and extending far beyond the tip of the rostrum. Pseudostigmatic organs swollen toward their middle beyond which they are setiform and minutely and sparsely pectinate. Abdomen large, elongate, and hairless above. Genital opening somewhat shield-shaped, smaller than anal opening, and situated about twice its greatest diameter in front of the latter. Legs long but hind pair not extending beyond the tip of the abdomen. Length, 0.92 mm.; width, 0.61 mm.

From top of Mary's Peak, Oregon; under moist stones; by the writer. From Corvallis, Oregon; under an old piece of wood which was lying on damp ground; by the writer. The single specimen which I have from Corvallis is larger than those obtained from the top of Mary's Peak, but appears to be the same in other respects. The type from Mary's Peak.

***Notaspis bipilis*** Hermann.

Recorded from top of Mary's Peak, Oregon; under a rotting log; by the writer. Recorded also from Corvallis, Oregon; on ground under an old piece of wood; by the writer.

***Cepheus flavus*** n. sp. (Pl. III, figs. 14, 15).

A long, reticulated, rough species. Lamellae very large, covering much of the cephalothorax, and united along their median free part so as to form a hood-like structure overhanging the rostrum. Lamellar and apparently interlamellar hairs also wanting. Pseudostigmatic

organs moderate, recurved, simple, and clavate. Abdomen reticulated above around the margins and along the free-projecting margins of the shoulders, but toward the center above the reticulations pass into a central pitted area. No hairs above. Genital opening subcircular in outline, about equal in size to anal opening, and situated about one-third its longest diameter in front of the latter, which is egg-shaped in outline. Posterior legs not reaching the tip of the abdomen. Tarsal claws subequal. Length, 0.79 mm.; width, 0.47 mm.

From the top of Mary's Peak, Oregon; under rotting logs; by the writer. From Corvallis, Oregon; under a log; by the writer. Description based on type individual from Corvallis. This individual is considerably different from the two specimens from Mary's Peak in that the pseudostigmatic organs are more strongly clavate, also there is a difference in the reticulations of the integument.

**Hermanniella punctulata** Berlese, var. **septentrionalis** Berlese.

Recorded from the top of Mary's Peak, Oregon; under a rotting log; by the writer.

**Hermanniella punctulata** Berlese, var. **columbiana** Berlese.

Recorded from the top of Mary's Peak, Oregon; under a rotting log; by the writer. From Mt. Jefferson, Oregon (elevation about 5,000 ft.); under logs; by the writer. From Coast Range Mountains, Oregon; under a log; by the writer.

**Hermanniella punctulata** Berlese, var. **robusta** n. var. (Pl. III, fig. 16).

Differs from the type in being much larger. Measurements of type (Berlese): "Ad 540  $\mu$  long., 380  $\mu$  lat." Measurements for var. **robusta** n. var.: Length, 0.81 mm.; width, 0.50 mm.

From top of Mary's Peak, Oregon; under a rotting log; by the writer. From Lake Permelia, Oregon (about 4,000 ft.); under moist dead wood lying on ground; by the writer. No differences noted between specimen from Mary's Peak (Coast Range) and those from Lake Permelia (Cascades). The type from Mary's Peak.

**Hermanniella punctulata** Berlese, var. **occidentalis** n. var. (Pl. III, fig. 17).

Considerably smaller than the foregoing variety. Pseudostigmatic organs more strongly clavate than in most of the varieties. Hind pair of legs extending to or beyond the tip of the abdomen. Length, 0.68 mm.; width, 0.40 mm.



From the top of Mary's Peak, Oregon; under a rotting log; by the writer. From Coast Range Mountains, Benton County, Oregon; under a log; by the writer. Two specimens, the type from Mary's Peak.

Family HOPLODERMATIDAE.

*Phthiracarus maximus* Ewing.

From the top of Mary's Peak, Oregon; under rotten logs; by the writer. From Coast Range Mountains, Benton County, Oregon; under logs; by the writer. From Corvallis, Oregon; under a log; by the writer.

THE RELATION OF THE FAUNA OF THE TOP OF MARY'S PEAK  
TO THAT OF THE REST OF THE COUNTRY AND EUROPE.

Here are recorded 18 specimens and varieties from the top of Mary's Peak, all coming from far up in the boreal life zone. Of these 18, we find 8 specimens and 4 varieties new to science. In regard to the distribution of these 18 species and varieties we find:

- 3 are recorded from the top of Mary's Peak only.
- 7 are recorded both from the top of Mary's Peak and from the surrounding region in the transition life zone.
- 3 are recorded from both the Coast Range and Cascade Mountains.
- 2 species, recorded from the top of Mary's Peak, have distinct varieties at lower altitudes.
- 4 species found at the top of Mary's Peak, have been recorded from the eastern part of the United States.
- 1 species from the top of Mary's peak is known to be widely distributed in Europe.

We find, therefore, that the beetle mite fauna of Mary's Peak, while related somewhat to that of the eastern part of the United States and Europe, is in the main quite distinct. Further, it is equally distinct from the fauna of the Cascade Mountains. Only 3 of the 18 forms recorded from the top of this mountain were also recorded from the Cascade Mountains. This is not because of lack of records from the Cascades, for I have probably as many species from these mountains as from the Coast Range. The beetle mites found on the top of Mary's



Peak are most closely related to those found in lower altitudes of the Coast Range Mountains. Seven of the 18 forms were found at lower altitudes, and in two other cases a slightly different variety was recorded for the lower altitudes. It would be interesting to know how closely the beetle mites from Mary's Peak are related to those of the South Pacific and Asia, but at present we know very little of the mite fauna of these latter regions.

#### SOME DISTINCTIVE FEATURES OF THE FAUNA OF THE HIGHER ALTITUDES OF MARY'S PEAK.

One of the most distinctive features of the beetle mite fauna of the eastern part of the United States is the very large number of shiny species in proportion to the rough ones. In this respect we find the fauna of Mary's Peak in harmony with that of the eastern United States. Thirteen of the 18 forms recorded from the top of the mountain are shiny. We note, among other things, 3 species of *Liacarus*, all new. We find 4 varieties of *Hermanniella punctulata* Berlese, the largest number recorded from any one locality. We note the occurrence of a species of the genus *Jugatala* Ewing, a genus in which the pteromorphae are united by a shelf-like chitinous projection from the anterior margin of the abdomen. We note the absence of species belonging to the family *Hypochthonidae*, and the record of only one species of *Hoplodermatidae*.

#### EXPLANATION OF PLATE III.

Fig. 1.—*Eupelops monticolus* n. sp. Left pseudostigmatic organ from above.

Fig. 2.—*Eupelops monticolus* n. sp. var. *subborealis* n. var. Left pseudostigmatic organ from above.

Fig. 3.—*Achipteria oregonensis* n. sp. Left pseudostigmatic organ from above.

Fig. 9.—*Oribatella acuta* n. sp. Left lamella from above.

Fig. 10.—*Liacarus bidentatus* n. sp. Tip of left lamella and its lamellar hair from above.

Fig. 11.—*Liacarus robustus* n. sp. Left pseudostigmatic organ from above.

Fig. 12.—*Liacarus acquidentatus* n. sp. Left pseudostigmatic organ from above.

Fig. 13.—*Liocarus acquidentatus* n. sp. Tip of left lamella and its lamellar hair from above.

Fig. 14.—*Cepheus flavus* n. sp. Left pseudostigmatic organ from above.

Fig. 15.—*Cepheus flavus* n. sp. Tarsus and part of tibia of leg I, from above.

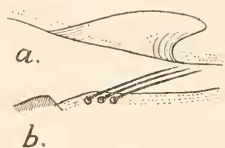
Fig. 16.—*Hermanniella punctulata* Berlese var. *robusta* n. var. Left pseudostigma and pseudostigmatic organ from above.

Fig. 17.—*Hermanniella punctulata* var. *occidentalis* n. var. Left pseudostigma and pseudostigmatic organ from above.

## The Micropterygidae Not of the Jugate Type (Lep.).

By R. J. TILLYARD, Macleay Fellow in Zoology, Linnean Society of New South Wales.

While carrying out researches upon the phylogeny of the Panorpid orders, I have made a careful study of the Jugate Lepidoptera. The result of the study of five genera of the family *Micropterygidae* (*sens. lat.*, including the *Eriocraniidae*) is that I find them all to be, not of the *jugate* type of the *Hepialidae*, but of a more primitive *jugo-frenate* type, in which the wing-coupling apparatus closely resembles that of the *Planipennia*, *Megaloptera* and *Mecoptera*. On the hind wing, near the base of the costa, there is a strongly developed frenum



a. Base of dorsum of forewing of *Micropteryx aruncella* Scopoli, to show jugal lobe (jugum) turned under the wing. Viewed from beneath. (x 60.) b. base of costa of hindwing of same, to show frenulum of three strong bristles. Viewed from above. (x 60.)

lulum of from two to six bristles (usually three or four), which becomes engaged, during flight, in the sinus formed between the dorsum of the forewing and the so-called jugum; this latter is bent *under the fore wing* with its apex pointing outward and forward, and acts as a retinaculum for the frenulum, and not in any way as a jugum or "yoke" for the costa of the hind wing as it does in the *Hepialidae*. The accompanying

figure will explain these points clearly. I will shortly publish a full account of my researches, and only send this short note because of the present-day difficulties and delays in sending communications from Australia to other parts of the world.